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MATERIALS FOR A REVISION OF THE TRICHIUROID FISHES OF THE GENUS *BENTHODESMUS*, WITH THE DESCRIPTION OF FOUR NEW SPECIES AND ONE NEW SUBSPECIES.

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When studying trichiuroid fishes of the families Scombrolabracidae, Gempylidae and Trichiuridae, the authors concluded that it was necessary to change the existing views on the number of species in the genus *Benthodesmus* reviewed recently by D. W. Tucker (1953, 1955, 1956).

The bulk of the material studied was collected by USSR research vessels in the Pacific and Indian oceans and is in the collections of the Institute of Oceanology in Moscow and the Zoological Institute in Leningrad (ZIL). Some additional material and data were received from the U.S. National Museum. The authors are greatly indebted to Drs. V. G. Osipov and V. P. Shuntov (Vladivostok) for presentation of their material, to Dr. B. B. Collette (Washington) for his kind help in loaning a specimen and sending radiographs from the U.S. National Museum and for critical review of the manuscript, to G. N. Pokhilskaya for drawings, and to A. A. Korovkina for X-raying the specimens.

Genus *Benthodesmus* Goode and Bean

Benthodesmus Goode and Bean, 1882: 379 (type-species *Lepidopus elongatus* Clarke = *B. elongatus*).

For description and full bibliography see Tucker (1953, 1955, 1956).

Comparative notes: Benthodesmus is closely allied to *Aphanopus*. The two genera form a natural group recognized by Tucker (1956) as the subfamily Aphanopodinae.[1]

[1] *Diplospinus* (and related *Paradiplospinus*) must be separated from here as having two nostrils on each side of the snout, much lower number of vertebrate and differing in some other features.

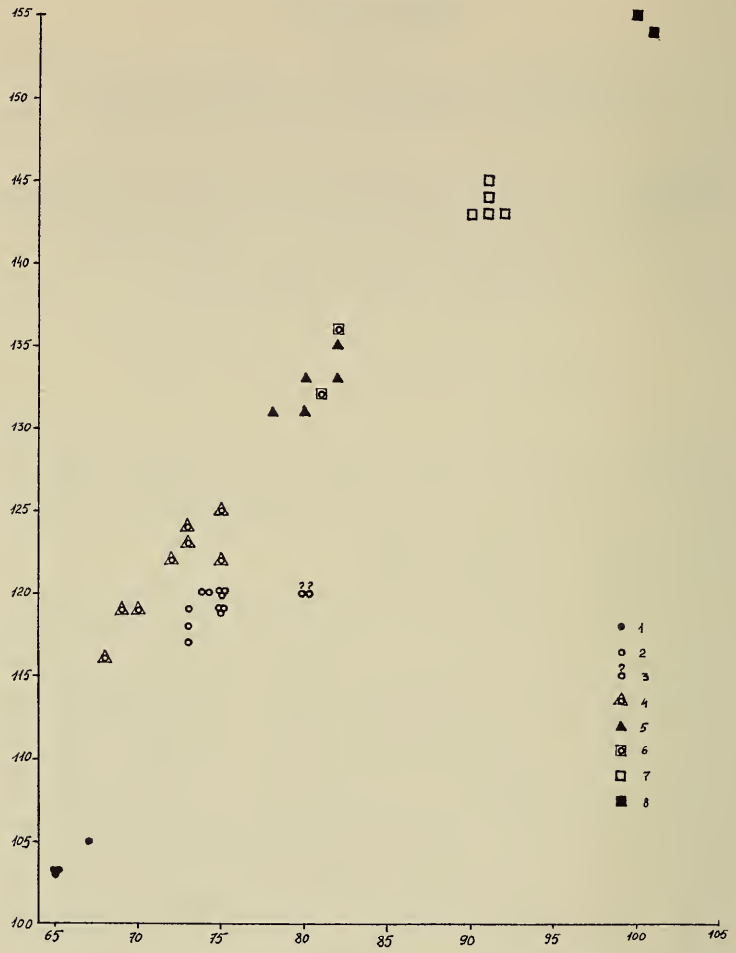

FIG. 1. Total number of dorsal fin-rays plotted against the number of anal fin-rays in *B. oligoradiatus* (1), *B. macrophthalmus* (2), *B. macrophthalmus* ? (3), *B. tenuis* (4), *B. tuckeri* (5), *B. vityazi* (6), *B. elongatus pacificus* (7), and *B. elongatus simonyi* (8). Only original data included.

Species: Tucker (1956) included only three species in *Bethodesmus* (*B. tenuis*, *B. elongatus* and *B. simonyi*) and suggested the possible specific identity of the two latter forms but postponed a final decision until the re-examination of the material from New Zealand, the type-

locality of *B. elongatus*. All other nominal species of *Benthodesmus* were considered by Tucker as synonyms of *B. tenuis* (with which he identified *Lepidopus aomori* Jordan and Snyder, *B. benjamini* Fowler and, questionably, *L. argenteus* Brauer) or *B. simonyi* (the only synonym is *B. atlanticus* Goode and Bean).

We conclude that there are more species of *Benthodesmus* than were previously recognized. This is based upon the fact that it is possible to distinguish in our material well-separated groups differing in the total number of dorsal and anal fin elements (fig. 1), dorsal spines and vertebrae as well as in the position of vent, some body proportions and other features. Scarcity of specimens (especially adults) does not allow certain establishment of the systematic status of all the groups distinguished. Nevertheless, it seems possible to describe here four new species—*B. oligoradiatus*, *B. macrophthalmus*, *B. tuckeri* and *B. vityazi*—and one new subspecies—*B. elongatus pacificus*—which are undoubtedly distinct from all known species.

Key to the species of *Benthodesmus*

1(8) Pelvic fins inserted under the pectoral base or before the anterior end of the pectoral base. Total number of dorsal elements 103–135. Number of vertebrae 103–139.

2(3) Total number of dorsal elements 103–105, including 32–33 spines; number of anal rays 65–67; number of vertebrae 103–105. Vent located before the vertical with the first soft dorsal ray, base of anal spines—under soft dorsal ray 1–3 ..... *B. oligoradiatus* new species.

3(2) Total number of dorsal elements 116–135, including 34–42 spines; number of anal rays 70–82; number of vertebrae 119–139. Vent located behind the vertical with third soft dorsal ray, base of anal spines—under soft dorsal ray 5–11.

4(7) Total number of dorsal elements 119–135, including 39–42 spines. External anal fin complete.

5(6) D XXXIX–XLII 79–88 (total 119–129). A II 69–75. Vert. 121–131. ..... *B. tenuis* (Günther)[2]

6(5) D XXXIX–XLII 90–93 (total 131–135). A II 78–82. Vert. 136–139. ..... *B. tuckeri* new species.

7(4) Total number of dorsal elements 116–121, including 34–36 spines. External anal fin rays present in posterior part of the fin only ..... *B. macrophthalmus* new species.

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[2] Some differences do exist between local populations of *B. tenuis* in the number of fin-elements and vertebrae (data after Tucker, 1955 and original material combined):

Japan—D XXXIX–XLII 83–84 (total 122–126), A II 71–75, vert. 124–131.

Gulf of Mexico—D XL–XLII 83–87 (total 125–129), A II 72–75, vert. 129–131.

West Africa—D XXXIX–XLII 80–86 (total 120–125), A II 70–75, vert. 123–128.

Philippines— D XXXIX–XLI 79–81 (total 119–122), A II 69–72, vert. 121–123.

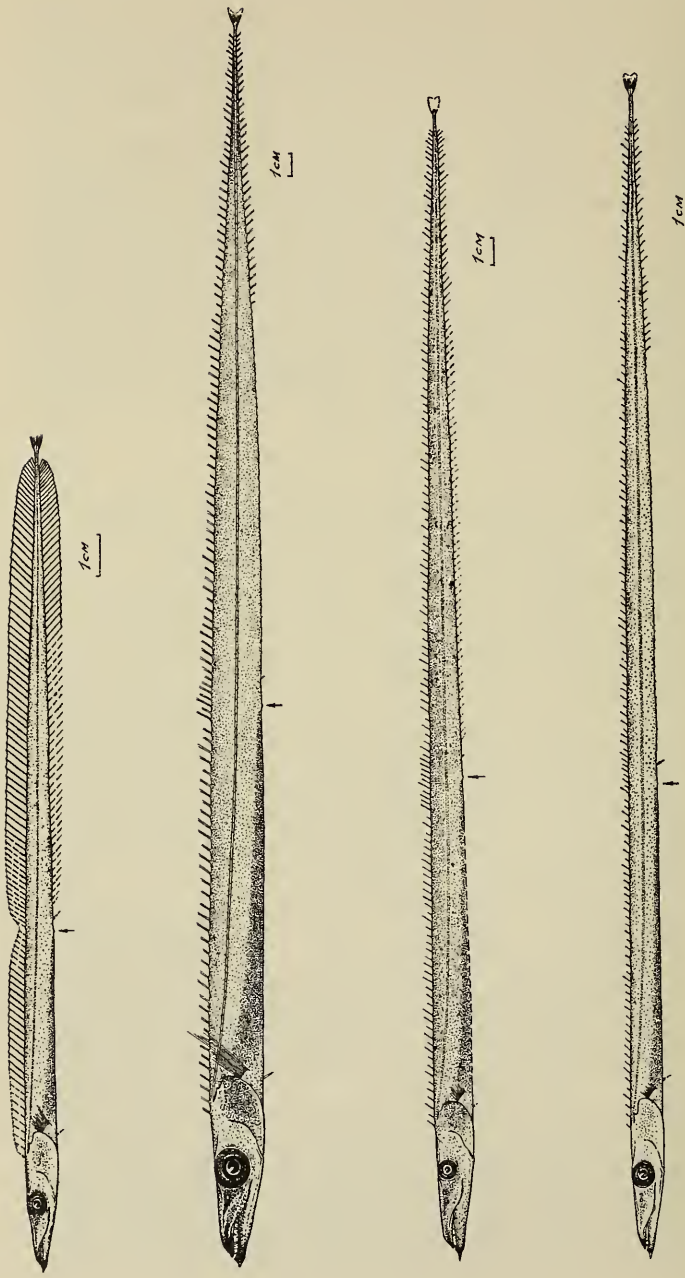

FIG. 2. New species of *Benthodesmus*. From above to below: *B. oligoradiatus* (holotype 183.2 mm SL, ZILN 39124), *B. macrophthalmus* (holotype 570 mm SL, ZILN 39125), *B. tuckeri* (paratype 454 mm SL, ZILN 39126), *B. vityazi* (holotype 264.5 mm SL, ZILN 39123).

8(1) Pelvic fins inserted distinctly behind the posterior end of the pectoral base. Total number of dorsal elements 132–155. Number of vertebrae 138–158.

9(10) D XLII–XLIII 89–93 (total 132–136). A II 81–82. Vert. 138–140. ..... *B. vityazi* new species.

10(9) D XLIV–XLVI 98–100 (total 143–155). A II 90–101. Vert. 149–158.

11(12) D XLIV–XLVI 104–110 (total 148–155). A II 93–101 ..... *B. elongatus simonyi* (Steindachner)

..... *B. elongatus elongatus* (Clarke)

12(11) D XLIV–XLV 98–102 (total 143–147). A II 90–92 .....

..... *B. elongatus pacificus* new subspecies.

The main diagnostic features used in the key are summarized in Table 1. The data for the variant specimens included in *B. macrophthalmus* with a question mark are shown in a separate column of the table.

Benthodesmus oligoradiatus Parin and Becker new species
(Fig. 2a)

?*Lepidopus argenteus* (*nec* Bonnaterre) Brauer, 1906: 292 Taf. XII, fig. 2.

Material: 4 specimens from 4 stations in the Arabian Sea and the Bay of Bengal.

R/V "*Vityaz*", st. 4725 (13°35′ N, 54°31′ E; 15 April 1960), conical net (1000 m—surface)—1 (183.2 mm SL), st. 4957 (13°33′ N, 90°54′ E; 15–16 Feb. 1961), Isaacs-Kidd Midwater Trawl—IKMT (100 m—surface)—1 (102.2 mm SL), st. 4959 (18°39′ N, 89°12′ E; 17 Feb. 1961), IKMT (314 m—surface)—1 (98.1 mm SL). R/V "Baikal", st. 4 (12° 54′ N, 64°27′ E; 9 Oct. 1966), IKMT (325 m—surface)—1 (175.7 mm SL).

Type series: Holotype—specimen 183.2 mm SL; R/V "*Vityaz*", st. 4725; ZIL 39124. Paratypes—all other specimens of the type-series (see *Material*). In the following description the numbers and notes in parentheses concern the paratypes.

Diagnosis: A species of *Benthodesmus* with pelvic fins inserted under the anterior end of the pectoral fin base; with a low number of vertebrae, dorsal and anal fin-elements; with the anal fin complete; with a rather large head; with the vent located from under the next to the last dorsal spine to the first dorsal soft ray.

Description: D XXXII 71, total 103 (XXXII–XXXIII 70–72, total 103–105). A II 65 (II 65–67). P 12 (12–13). Vert. 40 + 63 = 103 (41 + 64 = 105 in one paratype).

Measurements of the holotype 183.2 mm SL (the three paratypes 98.1 mm, 102.2 mm and 175.7 mm SL) in per cent of SL (from the tip of the *lower* jaw): preanal distance 42.9 (45.0, 43.0, 43.0), predorsal distance 13.5 (15.6, 15.2, 13.4), snout-vent distance 41.4 (44.3, 42.4,

42.0), head 16.6 (19.8, 19.5, 17.1), body depth 4.0 (4.3, —, 3.8), caudal peduncle depth 0.2 (0.3, 0.3, 0.3), length of spinous dorsal base 28.0 (29.2, 28.2, 29.6), length of soft dorsal base 52.7 (52.3, 55.2, 53.7). In per cent of head: interorbital 4.0 (4.1, 3.5, 4.0), eye 16.8 (15.5, 14.6, 15.8), snout 38.2 (36.6, 36.7, 37.4), maxillary 30.4 (28.5, 28.7, 29.0), body depth 24.0 (21.6, —, 22.3), caudal peduncle depth 1.3 (1.5, 1.5, 1.6).

Vent located just behind last dorsal spine (under next to last spine to first soft ray), base of jointed anal spines under third soft dorsal ray (under first—third soft ray). Scalelike pelvic fins inserted under anterior end of pectoral fin base (just before or under anterior end of pectoral fin base). Second anal spine flat and acute. External rays developed along whole anal fin base.

Two widely spaced fixed fangs near tip of snout on both sides of upper jaw and three somewhat smaller depressible fangs located near the first right and both hinder fangs. A lateral row of 10 (14 in one paratype) small teeth outside of anterior fangs and about ten slightly larger teeth behind them. On lower jaw a fixed fang anteriorly and about 20 small lateral teeth behind it. A single series of 10 small teeth on palatines.

Comparative notes: B. oligoradiatus, though described from adolescent specimens, evidently differs from the other species in much lower numbers of vertebrae and fin elements. Presence of well-developed external rays along the anal fin base also seems to be of diagnostic value, if not applied to juveniles only.

Only two specimens of *Benthodesmus* (both collected by the *"Valdivia"*) were recorded from the Western Indian Ocean (Tucker, 1953). The largest specimen (711 mm SL) was caught at 4°42′ N, 48°39′ E and identified by Brauer (1906) as *Lepidopus tenuis*. The number of fin elements (D 133, A 75) fully excludes the similarity with *B. oligoradiatus*. Another specimen—a juvenile 119 mm SL—from the same area (9°06′ N, 53°41′ E) has many fewer fin-rays (D ca. 115, A 67–70) and was described as the type of *Lepidopus argenteus* Brauer. Indication of approximate counting permits us to assume that the number of rays was probably higher. In this case the specimen may be conspecific with our material because other features in Brauer's description do not contradict the diagnosis of *B. oligoradiatus*. Nevertheless, the name *L. argenteus* Brauer, 1906 is invalid as being a primary junior homonym of *L. argenteus* Bonnaterre, 1788 [= *L. caudatus* (Euphrasen)] (see Tucker, 1953).

Distribution: Specimens of *B. oligoradiatus* were collected only in the Arabian Sea and the Bay of Bengal.

Benthodesmus macrophthalmus Parin and Becker new species
(Fig. 2b)

Material: 11 specimens from 2 stations in the Arafura Sea (and 2 variant specimens from 2 stations in the Western Equatorial Pacific).

R/S "*Akademik Berg*", st. A (9°01′ S, 130°39′ E; 26 May 1967; depth 540 m), bottom otter trawl—4 (454–570 mm SL), st. B (9°05′ S, 131°22′ E; 19 July 1967; depth 316 m), bottom otter trawl—7 (268–445 mm SL).

?R/V "*Vityaz*", st. 3699 (0°00′, 135°09′ E; 25 Aug. 1957), conical net (500 m—surface)—1 (227.3 mm SL), st. 3981 (4°58′ S, 146°59′ E; 27 April 1958), conical net (1000 m—surface)—1 (48.8 mm SL).

Type series: Holotype—specimen 570 mm SL; R/V "*Akademik Berg*", st. A, collected by V. P. Shuntov; ZIL 39125. Paratypes—10 specimens 268–504 mm SL from collection of the same vessel; the variant specimens collected by the R/V "*Vityaz*" are excluded from the type-series. In the following description, the numbers and notes in parentheses concern the paratypes.

Diagnosis: A species of *Benthodesmus* with pelvic fins inserted under the pectoral fin base; with relatively few dorsal spines; with a moderate number of dorsal and anal fin-elements; with external rays developed only in the posterior part of the anal fin; with a large eye.

Description: (for the type-series). D XXXVI 83, total 119 (XXXV–XXXVI 81–85, total 117–120). A II 73 (II 73–75). P 12 (12). Vert. 63 + 59 = 122 (58 – 63 + 59 – 62 = 119–123). (Gill rakers 4 + 1 + 18 = 23).

Measurements of the holotype 570 mm SL (and 5 paratypes 268–504 mm SL) in percent of SL: preanal distance 46.0 (45.0–46.5), predorsal distance 12.0 (11.0–12.2), snout-vent distance 44.1 (43.0–44.0), head 14.3 (13.5–14.2), body depth 4.8 (3.5–4.8), caudal peduncle depth 0.2 (0.2), length of spinous dorsal base 30.9 (29.5–30.3), length of soft dorsal base 55.2 (55.2–57.1). In percent of head: interorbital 7.6 (6.2–7.6), eye 20.0 (18.5–22.2), snout 44.9 (39.9–44.4), maxillary 38.4 (34.1–38.9), body depth 33.4 (24.3–35.0), caudal peduncle depth 1.7 (1.3–1.7).

Vent located under third soft dorsal ray (under soft ray 3–5), base of jointed anal spines—under seventh soft dorsal ray (under soft ray 5–7). Small scalelike pelvic fins inserted under pectoral fin base. Anal spines damaged in all specimens. External rays developed only in posterior half of anal fin base. Body canal of lateral line wide, its posterior part occupying whole side of caudal peduncle.

Two widely spaced, strong, fixed, and laterally flattened fangs near tip of snout on both sides of upper jaw and, on left side, two smaller depressible fangs (depressible fangs absent or represented by one or two canines near any of fixed ones). A lateral row of 5 (4–8) very small teeth outside of anterior fangs and 6 (8–10) larger teeth behind them. On lower jaw, a small fixed fang anteriorly and 12 (8–10) lateral teeth behind it. A single series of 8 (5–10) small teeth on palatines.

Body silver, but peduncle almost black; belly slightly darker than sides.

Description of variant specimens: D XXXIV 84–86, total 118–120. A II 80. P 12. Vert. 124 (in larger specimen).

Measurements of two specimens 48.8 and 227.3 mm SL in percent of SL; preanal distance 50.0, 40.0, predorsal distance 17.6, 10.5, snout-vent distance 48.2, 38.3, head 19.8, 12.5, body depth 5.1, 2.7, caudal peduncle depth 0.6, 0.2, length of spinous dorsal base 30.5, 23.4, length of soft dorsal base 49.9, 61.7, length of pectoral fin 5.7, —. In percent of head: interorbital 4.3, 4.2, eye 17.0, 17.9, snout 41.5, 44.5, maxillary 33.0, 32.3, body depth 26.6, 20.7, caudal peduncle depth 3.2, 1.1, length of pectoral fin 29.9, —, length of ventral 13.7, —.

Vent located under fourth (in smaller specimen) or under interspace between sixth and seventh (in larger one) soft dorsal rays, base of jointed anal spines under sixth and ninth soft dorsal rays, respectively. Second anal spine (in smaller specimen) strongly flattened, cardiform. External rays developed only in posterior part of anal fin in larger specimen but along whole fin base in smaller one.

In the larger specimen two fixed fangs present near the tip of snout on both sides of upper jaw and one depressible canine on left side near posterior fixed fang. A lateral row of 12–14 very small teeth outside of anterior fangs and 6 larger teeth behind them. On lower jaw a fixed fang near symphysis and 12 lateral teeth behind it. A single series of small teeth on palatines.

Comparative notes. Some hesitation arises as regards the uniting of the specimens of the type-series and the variant juveniles from the Western Equatorial Pacific under the same specific name. These groups differ slightly in the number of dorsal spines and anal elements (D_1 XXXV–XXXVI, A II 73–75 versus D_1 XXXIV, A II 80). This distinction seems insignificant but as shown in fig. 1 the correlation between the number of elements in the dorsal and anal fins is very stable in *Benthodesmus* species. We suggest, therefore, that the variant specimens may belong to another and still undescribed species but provisionally leave them in *B. macrophthalmus* because of the absence of representative series.

B. macrophathalmus is quite distinguishable from other species of *B. tenuis*—group in lower number of dorsal spines, larger eye and absence of external rays in the anterior half of anal fin. The last feature is typical also for the species of *B. elongatus*—group in which pelvic fins are always inserted more posteriorly.

In total number of dorsal and anal elements, *B. macrocephalus* agrees with the original description of *B. benjamini* for which Fowler (1938) indicates D 115–120, A 74. Having examined, however, radiographs and measurements of all Fowler's specimens we can conclude that some of them (including holotype) belong to *B. tenuis* and the rest to *B. tuckeri.*

As regards the other specimens of *Benthodesmus* mentioned in the literature, only one specimen 535 mm SL described by Weber (1913) from the Indo-Australian Archipelago (Kei Islands) under the name *Lepidopus tenuis* may belong here. This specimen was characterized as

follows: D 125–126, A 73, eye 6.5 in head. However the possibility of its correct identification is not less probable.

Benthodesmus tuckeri Parin and Becker new species
(Fig. 2c)

Benthodesmus benjamini Fowler, 1938: 45 (in part: only two of the paratypes; Philippines).

Material: 4 specimens from 2 stations near the Philippines and Java. R/V "*Albatross*", st. 5444 (13°45′ N, 120°46′ E; 16 Jan. 1908; depth 554 m; paratype of *B. benjamini*; USNM 98822)—1 (598 mm SL).

R/V "Orlik", st. 3 (10° S, 112° E; 2 Feb. 1963), otter trawl—3 (415–467 mm SL, all badly damaged).

Additional material: Radiograph of the 614 mm SL paratype of *B. benjamini* (USNM 98824).

Type series: Holotype—ripe female 598 mm SL; R/V "*Albatross*", st. 5444, USNM 98822. Paratypes—all other specimens of the type-series (see *Material* and *Additional material*). In the following description the numbers and notes in parentheses concern the paratypes.

Diagnosis: A species of *Benthodesmus* with pelvic fins inserted before the anterior end of pectoral fin base; with rather high number of vertebrae, dorsal and anal fin-elements; with the anal fin complete; with the vent located under fifth-seventh dorsal soft ray; with a moderate-sized eye.

Description: D L 91, total 131 (XLI–XLII 90–93, total 131–135). A II 81 (II 80–82). P 12 (12). Vert. 62 + 74 = 136 (60 – 64 + 72 – 77 = 136–138). Gill rakers 4 + 1 + 7 = 12 (4 + 1 + 8 = 13).

Measurements of the holotype 598 mm SL (and 3 paratypes 415–467 mm SL) in percent of SL: preanal distance 42.1 (42.3–44.0), predorsal distance 10.4 (10.8–11.5), snout-vent distance 40.5 (40.6–42.4), head 13.0 (12.8–13.5), body depth 5.2 (3.3), caudal peduncle depth 0.2 (0.2–0.3), length of spinous dorsal base 28.1 (26.2–27.4), length of soft dorsal base 60.2 (58.6–59.8). In percent of head: interorbital 11.0 (8.4–9.7), eye 12.1 (11.0–11.1), snout 46.4 (48.6-49.4), maxillary 38.8 (36.0–37.6), body depth 41.0 (24.7), caudal peduncle depth 1.8 (1.7–2.0).

Vent located under fifth soft dorsal ray (under soft ray 5–7), base of jointed anal spines—under ninth soft dorsal ray (under soft ray 8–11). Pelvic fins broken off (in one paratype in the form of flattened daggerlike spines), inserted before anterior end of pectoral fin base. Anal spines damaged in all specimens. External rays developed along whole anal base.

Two widely spaced fixed fangs near tip of snout on both sides of upper jaw, depressible fangs absent (one or two depressible fangs located near posterior fixed fangs). A laterial row of 3+ very small teeth outside of anterior fangs and 10 (about 6) larger compressed teeth behind

them. On lower jaw a short fixed fang anteriorly and 11 (6–8) teeth behind it. A single series of 8 (on the right side)—11 small teeth on palatines.

Comparative notes: This species is allied to *B. tenuis* but differs in a higher number of vertebrae, dorsal and anal fin-elements (see Table 1) and smaller eye. The difference in vertebral and fin-element counts seems especially significant when one compares the sympatric populations of both species from Philippines—Indonesian area. *B. tenuis* of this region has much lower counts than *B. tuckeri* (vert. 121–123; D XXXIX–XLI 79–81, total 119–122; A II 69–72 versus vert. 136–138; D XL–XLII 90–93, total 131–135; A II 80–82).

As can be seen from the radiographs, *B. benjamini*, described by Fowler (1938) from the Philippines, was established on mixed material in which 3 specimens of *B. tenuis* (one of them originally indicated as holotype) and 2 specimens of *B. tuckeri* were united. Both latter specimens are included here in the type-series of *B. tuckeri* one of them being selected as the holotype of the new species.

It is possible that *L. tenuis* from North-Eastern Africa described by Brauer (1906) may also belong to *B. tuckeri*. This specimen has 133 elements in dorsal fin but differs in somewhat lower count of anal rays.

Distribution: Specimens of *B. tuckeri* were collected in the waters adjacent to Philippine Islands (Fowler, 1938) and to the south of Java.

Benthodesmus vityazi Parin and Becker new species
(Fig. 2d)

Material: 2 specimens from 2 stations in the Equatorial Central Pacific.

R/V "*Vityaz*", st. 5117 (0°04′ N, 154°05′ W; 20–22 Oct. 1961), IKMT (440 m—0)—1 (264.5 mm SL), st. 5139 (0°01′ S, 175°56′ W; 8–9 Nov. 1961), IKMT (170 m—0)—1 (197.5 mm SL).

Type series: Holotype—specimen 264.5 mm SL; R/V "*Vityaz*", st. 5117; ZIL 39123. Paratype—specimen 197.5 mm SL; R/V "*Vityaz*", st. 5139. In the following description the numbers and notes in parentheses concern the paratype.

Diagnosis: A species of *Benthodesmus* with pelvic fins inserted behind the posterior end of pectoral fin base; with a relatively low (for species with posterior position of pelvic fins) number of vertebrae, dorsal and anal fin-elements; with the vent located under second or third dorsal soft ray; with external rays developed only in posterior part of anal fin.

Description: D XLIII 89, total 132 (XLII 93, total 136). A II 81 (II 82). P 12–13 (12). Vert. 138 (140). Gill rakers $3 + 1 + 6 = 10$.

Measurements of the holotype 264.5 mm SL (and the paratype 197.5 mm SL) in percent of SL: preanal distance 41.5 (41.4), predorsal distance 11.0 (11.7), snout-vent distance 40.0 (39.9), head 13.2 (13.5),

body depth 3.1 (3.4), caudal peduncle depth 0.2 (0.2), length of spinous dorsal base 28.1 (26.7), length of soft dorsal base 55.8 (57.0). In percent of head: interorbital 4.6 (4.5), eye 18.0 (15.4), snout 41.5 (41.4), maxillary 30.5 (29.4), body depth 23.1 (25.2), caudal peduncle depth 1.7 (1.5).

Vent located under interspace between second and third soft dorsal ray (under third soft ray), base of jointed anal spines under sixth soft dorsal ray (under interspace between sixth and seventh soft ray). Pelvic fins inserted conspicuously behind posterior end of pectoral fin base. Anal spines damaged (second anal spine flattened and sharpened). External rays developed only in posterior half of anal fin base (fine rays in anterior portion of fin before somewhat stronger rays in posterior half).

Two widely spaced fixed fangs flattened laterally near tip of snout on both sides of upper jaw. A lateral row of 6(8) very small teeth between symphysis of jaw and anterior fang, series of 8 (9) small teeth outside of fangs and about 10 larger teeth behind them. On lower jaw, a small fixed fang anteriorly and about 14 lateral teeth behind it. A single series of 13 teeth on palatines.

Comparative notes: There are no adult specimens of the species described in our collection and the type-series of *B. vityazi* consists of juveniles only. It seems evident, however, that presence of weakly developed external rays in the anterior portion of anal fin in the smaller of our specimens may be considered as a juvenile feature. The same growth changes are undergone by *B. elongatus* in which young specimens obtain external rays along the whole base of anal fin also.

B. vityazi is slightly distinguished from *B. tuckeri* in the number of dorsal and anal fin-elements and vertebrae but the position of pelvic fins is quite different in both species. This feature, as well as the external structure of the anal fin, indicates the closer relationship to *B. elongatus* than to any other member of the genus.

It is possible that the juvenile *Benthodesmus* collected between Hawaii and Tahiti (0°33′ S, 151°34′ W) by the "Challenger"—expedition (Günther, 1889) is conspecific with *B. vityazi*. This specimen was reexamined later by Tucker (1953) and identified as *B. tenuis* but according to the description the fish is in poor condition—abdominal portion of body together with pelvic and pectoral fins pulled out, caudal peduncle badly damaged, most of skin lost, and almost all of dorsal and anal fin-rays broken. The features retained—fin-ray counts (D XLI 76+, A I 68+) and especially location of the vent under second dorsal soft ray and the base of anal spines under fourth soft ray as figured by Tucker (1953)—may be considered as indicating possible identity with *B. vityazi*. Besides that, the localities where both our specimens and Günther's were collected are in the same region of the Pacific Ocean.

Distribution: All known specimens of *B. vityazi* came from equatorial part of the Central Pacific.

Benthodesmus elongatus pacificus Parin and Becker new subspecies
Lepidopus tenuis (*nec* Günther) Franz, 1910: 56 (Japan—Uruga Strait).
Benthodesmus atlanticus (*nec* Goode and Bean) Gilbert, 1917: 1 (Pacific coast of Canada).

Material: 5 specimens from 3 stations in the North-Western Pacific. R/V "*Vityaz*", st. 3578 (38°35′ N, 142°53′ E; 11 May 1957), dip-netted on surface—1 (1014 mm SL), st. 4017 (32°34′ N, 158°46′ E; 17 Aug. 1958), IKMT (90 m—0)—3 (32.5–48.3 mm SL).

Trawler "*Vityaz*", st. 22 (30° N, 141° E; 5 Sept. 1966), IKMT (500 m—0)—1 (230.9 mm SL).

Type series: Holotype—specimen 1014 mm SL R/V "*Vityaz*", st. 3578; ZIL 39127. Paratypes—all other specimens of the type-series (see *Material*). In the following description the numbers and notes in paretheses concern the paratypes.

Diagnosis: A North Pacific subspecies of *B. elongatus* with fewer dorsal and anal fin-elements and vertebrae than in *B. elongatus simonyi* (Steind.) from the North Atlantic and probably in *B. elongatus elongatus* (Clarke) from New Zealand.

Description: D XLIV 99, total 143 (XLIV–XLV 98–102, total 143–145). A II 92 (II 91–92). P 12 (12). (Vert. 149). Gill rakers $5 + 1 + 8 = 14$.

Measurements of the holotype 1014 mm SL (and 3 paratypes 33.2, 48.2 and 230.9 mm SL) in percent of SL: preanal distance 41.9 (51.9, 48.0, 38.1), predorsal distance 11.3 (19.4, 17.1, 10.9), head 13.9 (23.0, 18.7, 12.6), body depth 3.8 (5.4, 3.7, 2.6), length of spinous dorsal base 28.3 (31.6, 29.4, 25.1), length of soft dorsal base 57.8 (45.0, 49.2, 60.8). In percent of head: interorbital 5.4 (3.9, 4.4, 4.1), eye 17.0 (17.1, 17.8, 14.9), snout 50.1 (40.9, 40.0, 44.6), maxillary 34.9 (28.9, 27.8, 30.4), body depth 27.0 (23.7, 20.0, 20.4), caudal peduncle depth 1.4 (2.6, 2.2, 1.4), length of second anal spine (26.4, 27.8, —).

Vent located under first soft dorsal ray (under the last spinous—second soft ray), base of jointed anal spines—under fifth soft dorsal ray (under third-sixth soft ray). Scalelike pelvic fins inserted conspicuously behind posterior end of pectoral fin base (second anal spine in juvenile paratypes very large, daggerlike, quite similar to that in young specimens of *Aphanopus carbo*). External rays ca. 30-developed only in posterior third of anal fin base (in juvenile paratypes along the whole anal fin base). Body canal of lateral line comparatively narrow.

Two widely spaced fixed fangs near tip of snout on both sides of upper jaw. A lateral row of 7 small teeth outside of anterior fangs and 9 moderately large teeth posteriorly. On lower jaw, a small fixed fang anteriorly and 14 lateral teeth behind it. Teeth on palatines indistinct.

Body silvery, caudal peduncle darkened.

Comparative notes: Specimens of *Benthodesmus* reported by Franz (1910) from Japan and by Gilbert (1917) from British Columbia evidently belong here. Both individuals were originally described as having 142 rays in the dorsal fin but after reexamination Tucker (1953) found 147 fin-elements in Gilbert's specimen.

The difference in total dorsal ray counts between the North Atlantic *B. elongatus simonyi* and *B. elongatus pacificus* is comparatively slight (148–155 and 142–147 rays respectively). However these counts seem not to intergrade and warrant recognition at the subspecific level.

Distribution: The range of *B. elongatus pacificus* is limited to the temperate North Pacific (Japan, British Columbia). Other subspecies (considered previously as separate species) are reported from the Southern Hemisphere (*B. elongatus elongatus*) and from temperate North Atlantic (*B. elongatus simonyi*) (see Tucker, 1953, 1955).

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